

REMARKS

Claims 1-16 are pending. By the Office Action, claims 1-16 are rejected under 35 U.S.C. §102(b) and §102(e). By this Amendment, claims 1 and 2 are amended. Support for the amendments to claims 1 and 2 can be found in the specification as originally filed, such as at pages 32-33 and claims 1 and 2 as originally filed. No new matter is added.

I. Rejections Under §102

Claims 1-10 are rejected under 35 U.S.C. §102(b) over Smith. Claims 1-16 are rejected under 35 U.S.C. §102(b) over Angelopoulos. Claims 1-10 are rejected under 35 U.S.C. §102(b) over Nakashima. Because these rejections are similar, they will be addressed together. Applicants respectfully traverse the rejections.

A. The Claimed Invention

Independent claim 1 is directed to an anti-reflection film material used in lithography which is an anti-reflection film material used in lithography and contains at least a polymer compound having repeating units for copolymerization represented by the recited general formula (1). Independent claim 2 is directed to an anti-reflection film material used in lithography which is an anti-reflection film material used in lithography and contains at least a polymer compound having repeating units for copolymerization represented by the recited general formula (2) and a polymer compound having repeating units for copolymerization represented by the recited general formula (3). In each of claims 1 and 2, the respective polymers are specifically defined, and include a specific group of monovalent organic groups from which the substituent R³ is selected.

The anti-reflection film according to the claimed invention possesses an outstanding reflection preventive effect that halation and a standing wave can be fully

suppressed at the time of exposure, especially in lithography where a short wavelength light is used. Moreover, because the acid diffusion to the photoresist film from the anti-reflection film can be prevented at the time of exposure, a resist pattern is made in a perpendicular configuration. Furthermore, etch selectivity is high, etch rate is higher than the photoresist film at the time of etching of the anti-reflection film, and an etch rate is slower than a substrate at the time of etching of the substrate. Accordingly, a fine pattern can be formed on a substrate with a high degree of accuracy by lithography. See specification at page 14, line 17 to page 15, line 3. Such an anti-reflection film material is nowhere disclosed in the cited references.

B. The References Do Not Disclose the Claimed Invention

Smith is directed to curable epoxy organopolysiloxanes having pendant oxirane groups and pendant chromophoric groups, which cure to transparent crosslinked resins that are colored or fluoresce in ultraviolet light and are compatible with other silicone resins. Smith at Abstract. See also col. 1, lines 13-14; col. 2, lines 10-26; col. 5, lines 45-75; and col. 6, lines 69-73.

Angelopoulos is directed to antireflective compositions having SiO-containing polymers with pendant chromophore moieties, which compositions are described to be useful antireflective coating/hardmask compositions in lithographic processes. The compositions are described to provide outstanding optical, mechanical and etch selectivity properties while being applicable using spin-on application techniques. Angelopoulos describes that the compositions are especially useful in lithographic processes used to configure underlying material layers on a substrate, especially metal or semiconductor layers. Angelopoulos at Abstract. See also col. 3, lines 5-49 and col. 4, lines 7-44.

Nakashima is directed to high molecular weight silicone compounds that are included in chemically amplified positive resist compositions. The resist composition is sensitive to actinic radiation and has a high sensitivity and resolution so that it is suitable for microfabrication with electron beams or deep UV. Nakashima at Abstract. See also col. 3, line 18 to col. 4, line 51; col. 5, lines 33-57; col. 5, lines 63-68; and col. 10, lines 36-66.

However, each of Smith, Angelopoulos, and Nakashima fails to disclose all of the features of the claimed invention.

First, at least Smith and Nakashima each fails to disclose that the disclosed compounds, such as the organosiloxanes of Smith or the high molecular weight silicone compounds of Nakashima, are for an anti-reflection film material used in lithography, as specifically required in independent claims 1 and 2.

Second, each of Smith, Angelopoulos, and Nakashima fails to disclose the claimed polymers. Claim 1 specifically requires a polymer compound having repeating units represented by the general formula (1), and claim 2 specifically requires a polymer compound having repeating units represented by the general formula (2) and a polymer compound having repeating units represented by the general formula (3). In the recited polymers, the substituent R^3 is specifically defined as being selected from an identified group of monovalent organic groups. See claims 1 and 2. However, None of Smith, Angelopoulos, and Nakashima disclose polymer compounds having repeating units bearing the identified monovalent organic groups as the claimed substituent R^3 .

In the absence of any such teachings, none of Smith, Angelopoulos, and Nakashima can anticipate the claimed invention of independent claims 1 and 2. Claims 3-16 ultimately

depend from claim 1 or claim 2, and thus are not anticipated by the cited references for the same reasons as claims 1 and 2.

Accordingly, the rejection is overcome and must be withdrawn. Reconsideration and withdrawal of the rejection are respectfully requested.

II. Conclusion

In view of the above amendments and remarks, it is respectfully submitted that the above-identified patent application is in condition for allowance. Favorable consideration and prompt allowance are therefore respectfully requested.

Should the Examiner believe anything further would be necessary in order to place the application in condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

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